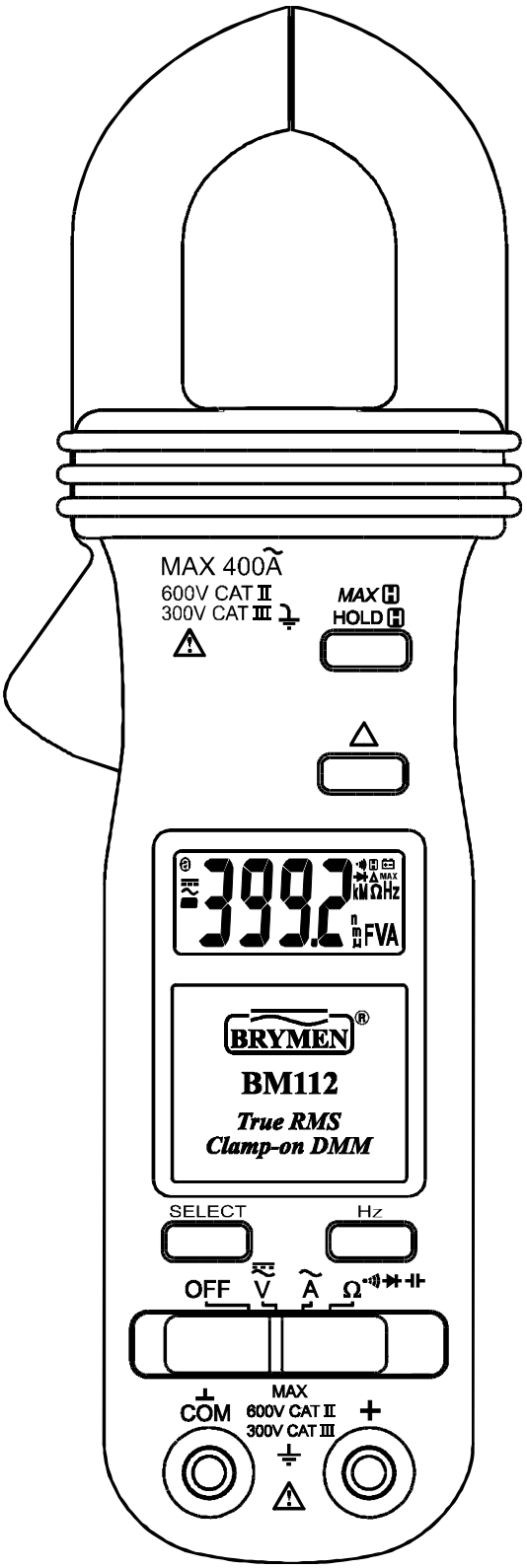
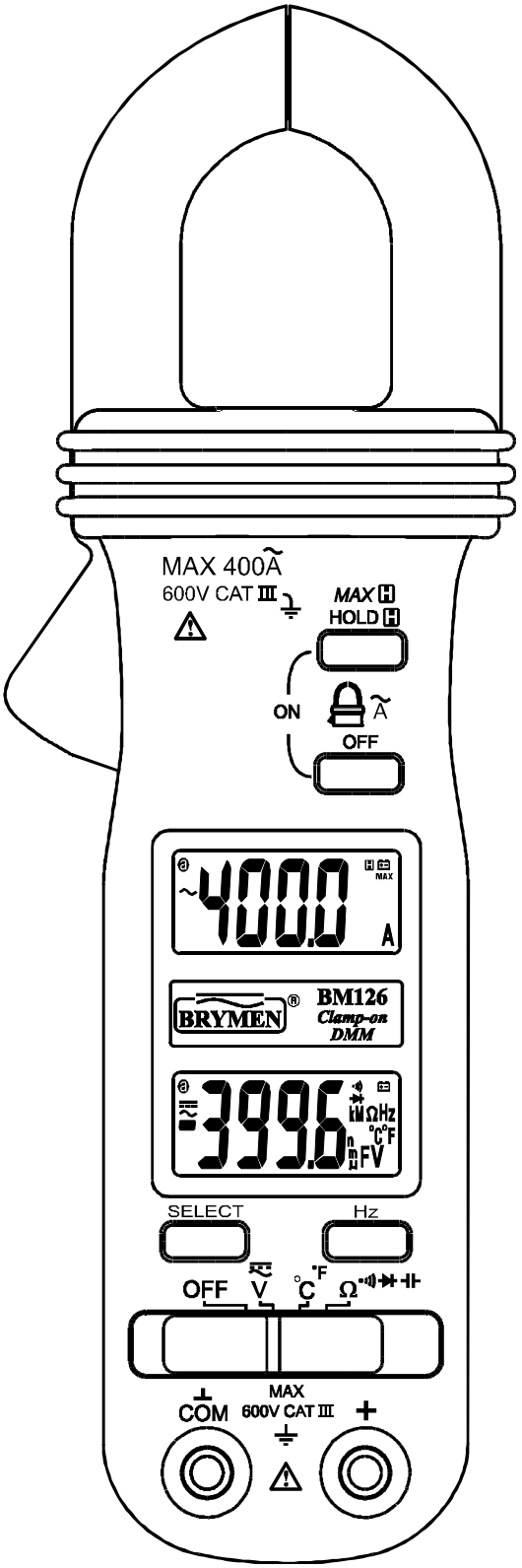




USER'S MANUAL

BM111 / BM112 Single Display
BM125 / BM126 Twin Displays
Versatile Clamp-on Multimeter Series

BRYMEN®
BRIGHT PEOPLE'S CHOICE

1) SAFETY

This manual contains information and warnings that must be followed for operating the instrument safely and maintaining the instrument in a safe operating condition. If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.

The meter meets the requirements for double insulation to IEC61010-2-032(1994), EN61010-2-032(1995), UL3111-2-032(1999):
BM125 & BM126:
Category III 600 Volts ac and dc.
BM111 & BM112:
Category II 600 Volts ac and dc.
Category III 300 Volts ac and dc.

PER IEC61010 OVERVOLTAGE INSTALLATION CATEGORY
OVERVOLTAGE CATEGORY II
Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation.
Note – Examples include household, office, and laboratory appliances.
OVERVOLTAGE CATEGORY III
Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.
Note – Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.
OVERVOLTAGE CATEGORY IV
Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation. Note – Examples include electricity meters and primary over-current protection equipment.

TERMS IN THIS MANUAL

WARNING identifies conditions and actions that could result in serious injury or even death to the user.

CAUTION identifies conditions and actions that could cause damage or malfunction in the instrument.

WARNING

To reduce the risk of fire or electric shock, do not expose this product to rain or moisture. The meter is intended only for indoor use.

To avoid electrical shock hazard, observe the proper safety precautions when working with voltages above 60 VDC or 30 VAC rms. These voltage levels pose a potential shock hazard to the user.

Inspect test leads, connectors, and probes for damaged insulation or exposed metal before using the instrument. If any defects are found, replace them immediately.

Do not touch test lead tips or the circuit being tested while power is applied to the circuit being measured. To avoid accidentally short circuit of bare (uninsulated) hazardous live conductors or busbars, switch them off before insertion and removal of the current clamp jaws. Contact with the conductor could result in electric shock. Keep your hands/fingers behind the hand/finger barriers that indicate the limits of safe access of the meter and the test leads during measurement.

CAUTION

Disconnect the test leads from the test points before changing meter functions.

INTERNATIONAL ELECTRICAL SYMBOLS

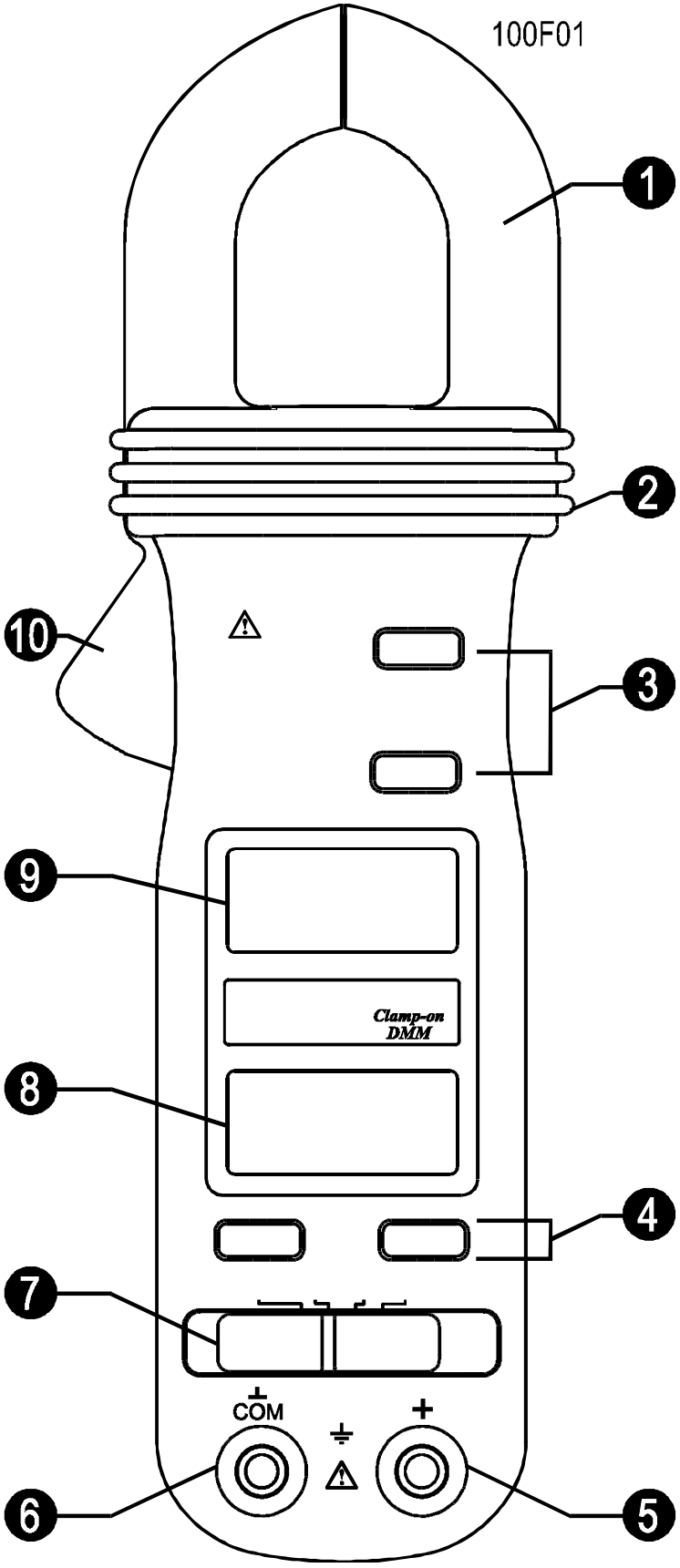
- ⚠ Caution ! Refer to the explanation in this Manual
- ⚠ Caution ! Risk of electric shock
- ⏚ Earth (Ground)
- ⧈ Double Insulation or Reinforced insulation
- ⏛ Fuse
- ~ AC--Alternating Current
- ⎓ DC--Direct Current

2) CENELEC Directives

The instruments conform to CENELEC Low-voltage directive 73/23/EEC and Electromagnetic compatibility directive 89/336/EEC

3) PRODUCT DESCRIPTION

This user's manual uses only representative model(s) for illustrations. Please refer specification details for function availability to each model.



1) Transformer Clamp Jaw for AC current magnetic field pick up

2) Hand/Finger Barrier to indicate the limits of safe access of the meter during measurement

3) Push-buttons for special functions & features. Also as power ON/OFF buttons for ACA function in Twin Display models

4) Push-buttons for special functions & features on Slide-switch Selector functions

5) Input Jack for all functions EXCEPT non-invasive ACA current function

6) Common (Ground reference) Input Jack for all functions EXCEPT non-invasive ACA current function

7) Slide-switch Selector to turn the primary display power ON/OFF and Select a function

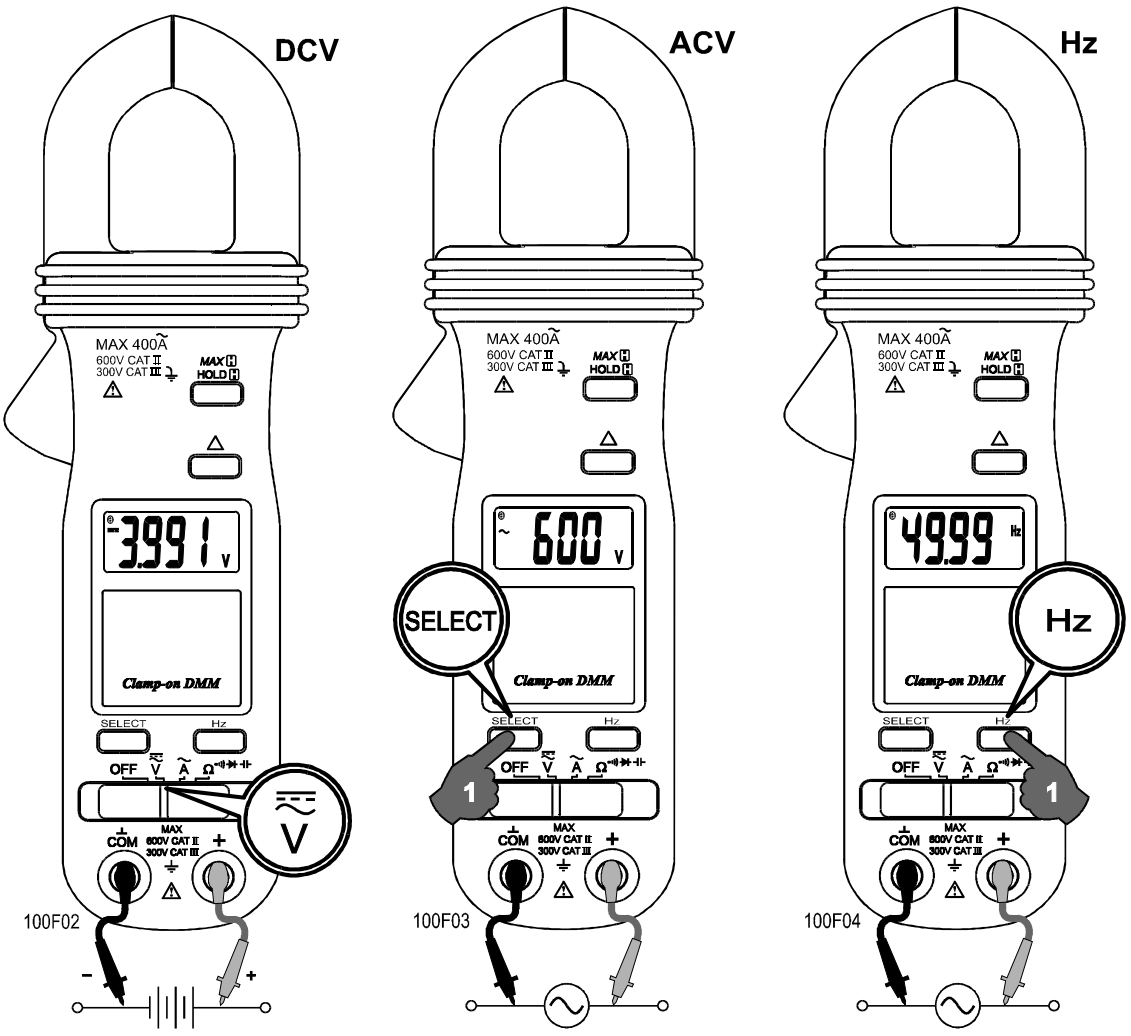
8) 3-3/4 digits 4000 counts LCD display (Twin Displays models only)

9) 3-3/4 digits 4000 counts LCD display

10) Jaw trigger for opening the

transformer clamp jaw

4) OPERATION



DC Voltage, AC Voltage, Hz Frequency functions

Inputs are made through the test leads terminals. Slide-switch on defaults at DC voltage. Press **SELECT** button momentarily to select AC voltage.

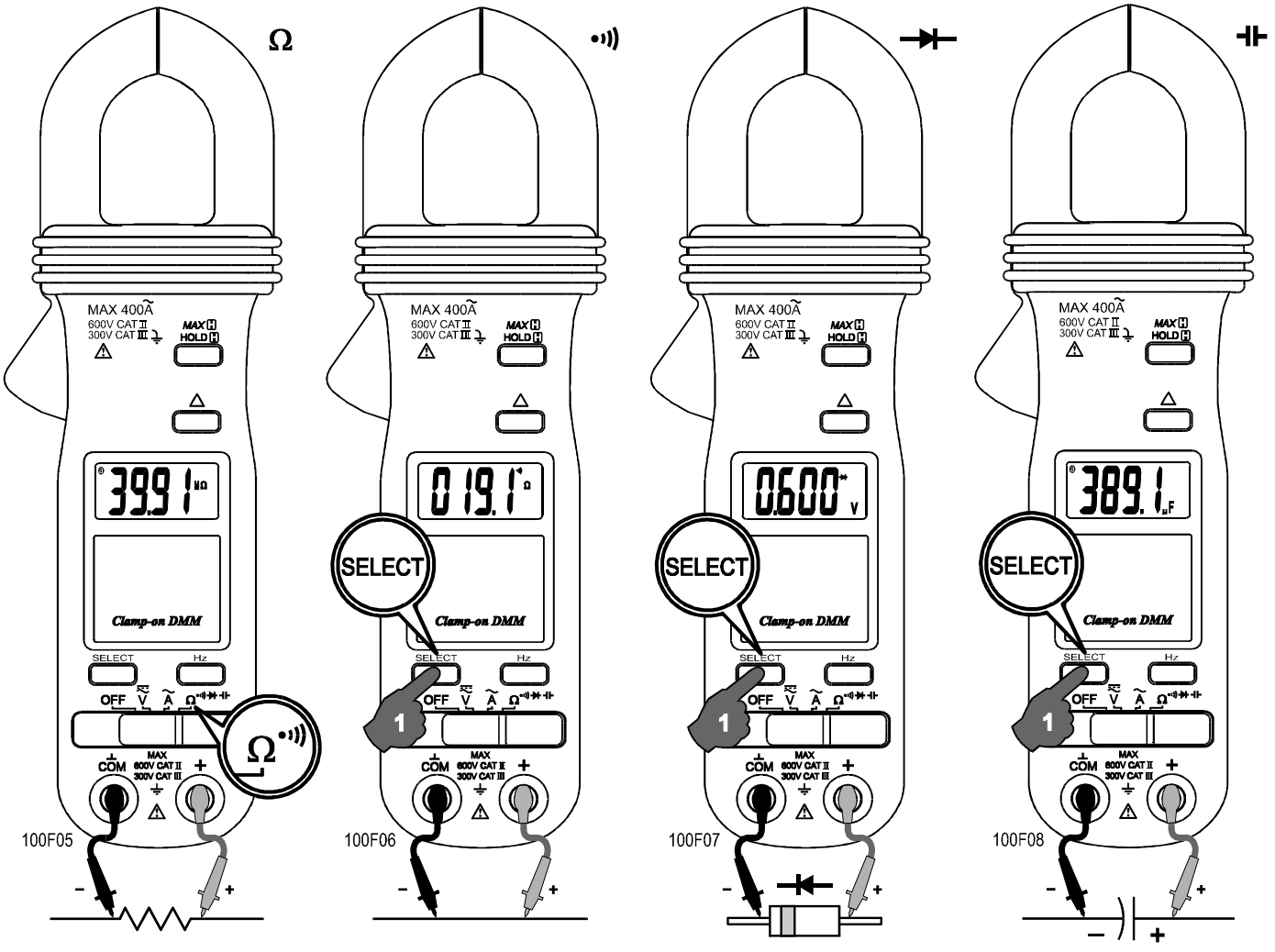
Press the **Hz** push-button momentarily to activate Hz Frequency function in the following slide-switch functions:

BM111 & BM112: DCV & ACV via the test leads; ACA via the clamp jaw
BM125: DCV, ACV, DCμA & ACμA via the test leads
BM126: DCV & ACV via the test leads

Note: DC 400.0mV range is designed with 1000MΩ high input impedance for least current drain in measuring small signals, and can cope better with most commercially available voltage output transducers/adapters. The non-zero display reading is normal

when the meter inputs are open circuit, which will not affect actual measurement accuracy. The meter will show close to zero reading when the inputs are shorted. Open input is actually a floating condition, which is not a zero-volt-input condition.

Note: Hz input sensitivity varies automatically with function range selected while activating the Hz function. Lowest range has the highest sensitivity, and the highest range has the lowest sensitivity. Activating the Hz function *WHILE* measuring the specific function signal (auto ranging) can automatically select the best sensitivity range to avoid electrical noise which may cause unstable Hz reading. However, if the Hz reading shows zero due to insufficient sensitivity, activate the Hz function *BEFORE* measuring the specific function signal (the meter is then in the lowest range) can select the highest sensitivity range.



CAUTION

Using Resistance, Continuity, Diode or Capacitance function in a live circuit will produce false results and may damage the instrument. In many cases the suspected component must be disconnected from the circuit to obtain an accurate measurement reading

Ω Resistance, and •)) Continuity functions

Inputs are made through the test leads terminals. Slide-switch on defaults at Ω. Press **SELECT** button momentarily to select •)) Continuity function which is convenient for checking wiring connections and operation of switches. A continuous beep tone indicates a complete wire.

⊣ Diode test function

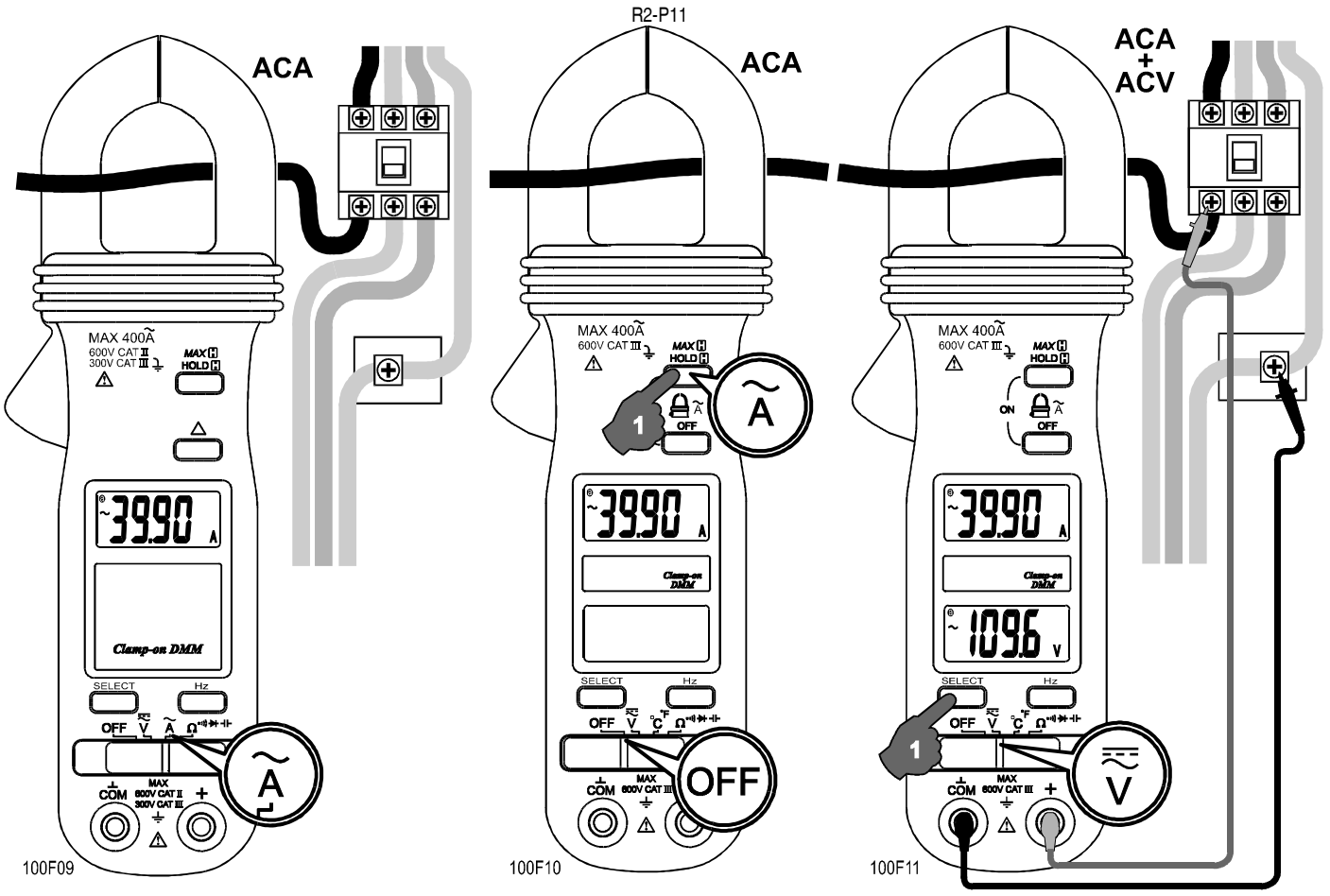
Inputs are made through the test leads terminals. Slide-switch on defaults at Ω. Press **SELECT** button momentarily 2 times to select ⊣ Diode test function. Normal forward voltage drop (forward biased) for a good silicon diode is between 0.400V to 0.900V. A reading higher than that indicates a leaky diode (defective). A zero reading indicates a shorted diode (defective). An OL indicates an open diode (defective). Reverse the test leads connections (reverse biased) across the diode. The digital display shows OL if the diode is good. Any other readings indicate the diode is resistive or shorted (defective).

⏑ Capacitance function

Inputs are made through the test leads terminals. Slide-switch on defaults at Ω. Press **SELECT** button momentarily 3 times to select ⏑ Capacitance function. Relative zero Δ mode (BM111 & BM112 only) can be used to zero out the parasitic capacitance of the leads and the internal protection circuitry of the meter when measuring low capacitance in the order of Pico Farad (pF).

CAUTION

Discharge capacitors before making any measurement. Large value capacitors should be discharged through an appropriate resistance load



ACA Current clamp-on function

Inputs are made through the clamp jaws for non-invasive ACA current measurements.

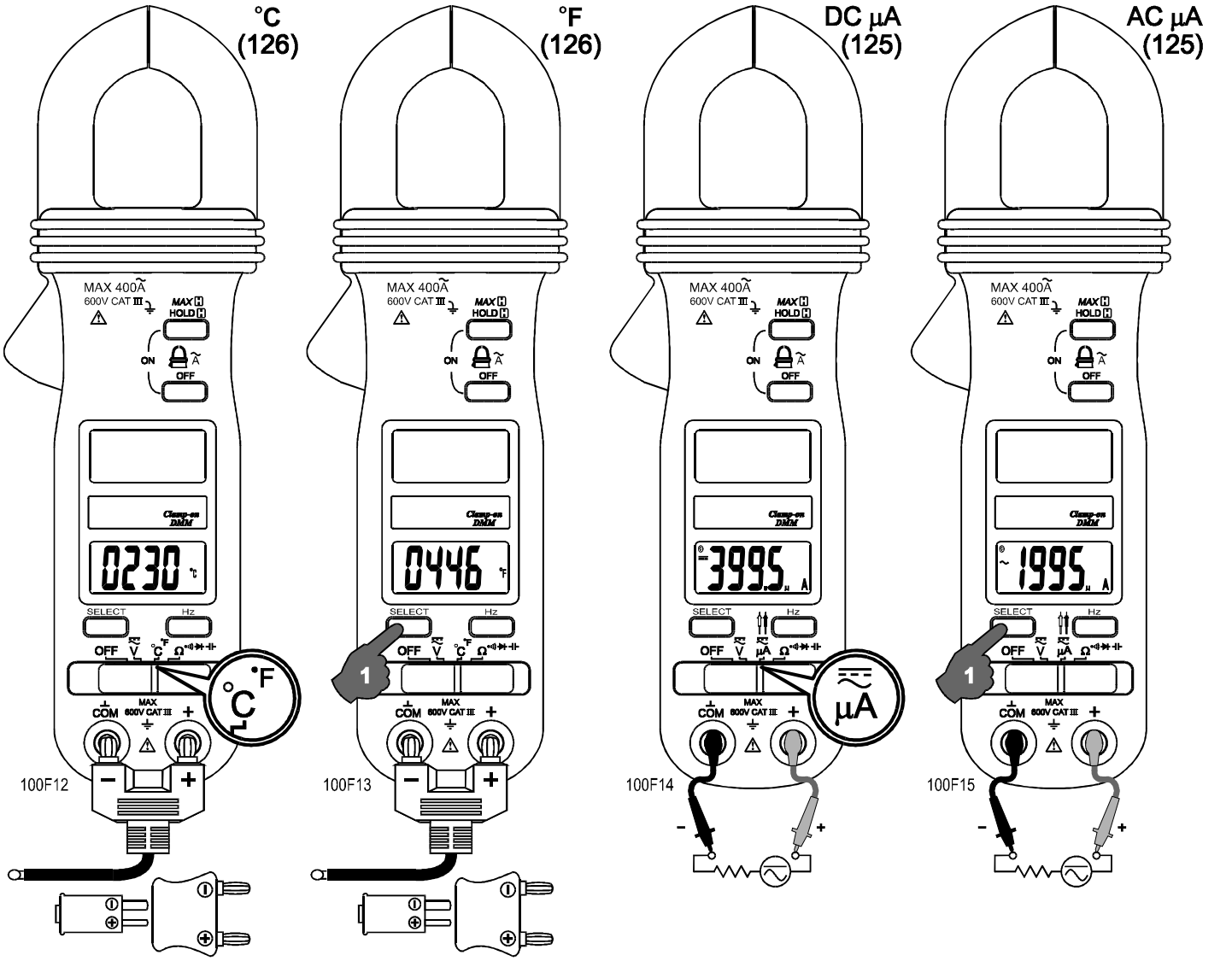
In BM111 & BM112, the single input single display models, use the slide-switch to select the ACA function.

In BM125 & BM126, the dual inputs twin displays models, press the **OFF** push button momentarily to power on and off the separate ACA function display. The **HOLD** push button can also be used as the ACA function power on hotkey. This twin display ACA function can be used simultaneously with the voltage or any other slide-switch functions when making measurements.

CAUTION

Press the jaw trigger and clamp the jaws around only one single conductor of a circuit for load current measurement. Make sure the jaws are completely closed, or else it will introduce measurement errors. Enclosing more than one conductor of a circuit will result in differential current (like identifying leakage current) measurement.

Strong Electro-magnetic field environments such as high-current transformers, motors and conductors may affect measurement accuracy.



Temperature function (BM126 only)

Be sure to insert the banana plug type-K temperature bead probe Bkp60 with correct **+ −** polarities. Slide-switch on defaults at degree C (Celsius). Press SELECT button momentarily to select degree F (Fahrenheit). You can also use a plug adapter Bkb32 (Optional purchase) with banana pins to type-K socket to adapt other type-K standard mini plug temperature probes.

µA Current function (BM125 only)

Inputs are made through the test leads terminals. Slide-switch on defaults at **DC**. Press **SELECT** button momentarily to select **AC**.

Application notes:

1) The DC µA function is designed especially for HVAC/R flame sensor applications. The 0.1µA resolution is useful for identifying the minute current changes in flame detector applications. Flame signal current check should indicate steady flame

signal of at least 2μA for a rectification type, or 1.5μA for an ultraviolet type (8μA for self checking systems). If a flame signal current with inadequate strength or fluctuation beyond 10%, check the following to avoid the risk of unwanted flame relay dropout :

1-1) For gas or oil flames (Minipeeper):

- Low supply voltage
- Detector location
- Defective detector wiring
- Dirty viewing windows
- Faulty Minipeeper

1-2) For oil flames (Photocell):

- Detector location & wiring
- Smoky flame or poorly adjusted air shutter
- Faulty Photocell
- Temperature over 165 F (74 C) at photocell

1-3) For gas flames (Flame Rod):

- Ignition interference (A flame signal current difference with the ignition both on and off greater than 0.5μA indicates the presence of ignition interference)
- Insufficient ground (must be at least 4 times the detector area)
- Flame lifting off burner head (ground), or not continuously in contact with the flame rod
- Temperature in excess of 600 F (316 C) at the flame electrode insulator causing short to ground.

HOLD

The hold feature freezes the display for later view. Press the **HOLD** button momentarily to activate and to exit the hold feature in the following function(s):

BM111 & BM112: All functions

BM125 & BM126: Upper display ACA function

MAX

The max feature compares and displays the measured maximum value as fast as 30ms with auto-ranging capability. Press the ***MAX*** button for 1 second or more to activate and to exit the max feature in the following function(s):

BM111 & BM112: DCV, ACV & ACA functions

BM125 & BM126: Upper display ACA function

Relative zero Δ mode (BM111 & BM112 only)

Relative zero Δ mode allows the user to offset the meter consecutive measurements with the displaying reading as the reference value. The display will now show readings relative to the stored reference value. That is, display = reading - stored value. Press the Δ button momentarily to activate and to exit relative zero mode.

Auto-ranging

Where there is more than one measuring range under a selected meter function, the LCD annunciator "**a**" turns on. The meter will automatically switch to the best resolution range when making measurements. No manual ranging selection is required.

Auto Power Off (APO)

When the meter is on, the Auto Power Off (APO) feature will switch the meter into a sleep mode automatically to extend battery life after approximately 30 minutes of no slide-switch nor push button operations. To wake up the meter from APO, press the buttons momentarily or set the slide-switch to the OFF position and then slide back on again. Always set the slide-switch to the OFF position manually when the meter is not in use.

5) MAINTENANCE

WARNING

To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input jacks and turn OFF the meter before opening the case. Do not operate with open case.

Trouble Shooting

If the instrument fails to operate, check batteries and test leads etc., and replace as necessary. Double check operating procedure as described in this user's manual

If the instrument voltage-resistance input terminal has subjected to high voltage transient (caused by lightning or switching surge to the system) by accident or abnormal conditions of operation, the series fusible resistors will be blown off (become high impedance) like fuses to protect the user and the instrument. Most measuring functions through this terminal will then be open circuit. The series fusible resistors and the spark gaps should then be replaced by qualified technician. Refer to the LIMITED WARRANTY section for obtaining warranty or repairing service.

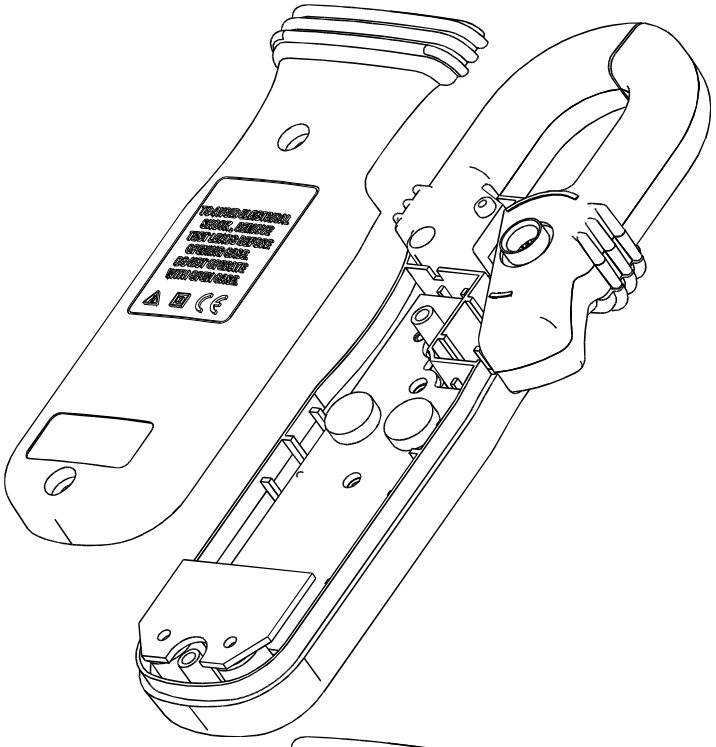
Cleaning and Storage

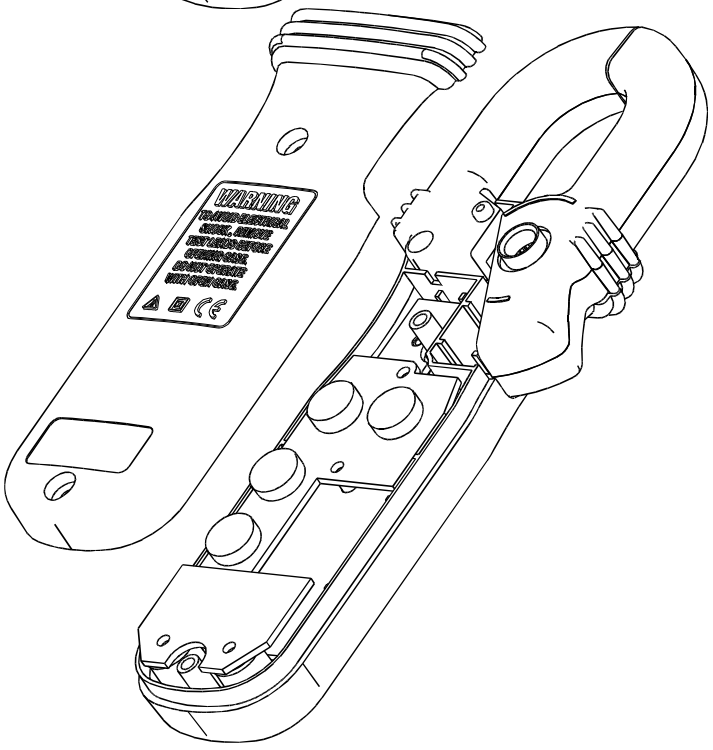
Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for periods of longer than 60 days, remove the batteries and store them separately

Battery replacement

The meters use standard 1.5V alkaline button batteries (IEC/JIS LR44, GPA76, or V13GA).
In models BM111 & BM112, 2 batteries are used.
In models BM125 & BM126, 4 batteries are used. 2 batteries are used for the slide-switch functions, and the other 2 batteries are used for the dual display ACA function separately.

Loosen the two screws from the case bottom and remove the bottom case. Slide the battery out the side of the holder and replace with a new battery (observe polarity). Replace the bottom case. Re-fasten the screws.




WARNING

LIMITED WARRANTY

BRYMEN warrants to the original product purchaser that each product it manufactures will be free from defects in material and workmanship under normal use and service within a period of one year from the date of purchase. BRYMEN's warranty does not apply to accessories, fuses, fusible resistors, spark gaps, batteries or any product which, in BRYMEN's opinion, has been misused, altered, neglected, or damaged by accident or abnormal conditions of operation or handling.

To obtain warranty service, contact your nearest BRYMEN authorized agent or send the product, with proof of purchase and description of the difficulty, postage and insurance prepaid, to BRYMEN TECHNOLOGY CORPORATION. BRYMEN assumes no risk for damage in transit. BRYMEN will, at its option, repair or replace the defective product free of charge. However, if BRYMEN determines that the failure was caused by misused, altered, neglected, or damaged by accident or abnormal conditions of operation or handling, you will be billed for the repair.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE. BRYMEN WILL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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